

WHAT IS CLAIMED IS:

- 1 1. A method of handling a computer task using an
2 intelligent agent, the method comprising the steps of:
3 (a) based upon an objective criteria, selecting
4 at least one selected program module from a plurality
5 of program modules having varied degrees of domain
6 knowledge, wherein the plurality of program modules
7 are configured to handle a common computer task; and
8 (b) configuring an intelligent agent to execute
9 the at least one selected program module to handle
10 the computer task.
- 1 2. The method of claim 1, wherein the intelligent
2 agent includes only the selected program module from the
3 plurality of program modules, and wherein the configuring
4 step includes the step of constructing the intelligent
5 agent using the selected program module.
- 1 3. The method of claim 1, wherein the intelligent
2 agent includes each of the plurality of program modules,
3 and wherein the configuring step includes the step of
4 configuring the intelligent agent to execute only the
5 selected program module to handle the computer task.
- 1 4. The method of claim 1, wherein the selecting step
2 is performed by the intelligent agent.
- 1 5. The method of claim 1, wherein the selecting step
2 is performed by an agent manager.
- 1 6. The method of claim 1, wherein the plurality of
2 program modules are additive program modules, and wherein
3 the selecting step includes the step of selecting a subset

4 of the plurality of program modules to handle the computer
5 task.

1 7. The method of claim 1, wherein the plurality of
2 program modules are alternative program modules, and
3 wherein the selecting step includes the step of selecting
4 only one of the plurality of program modules to handle the
5 computer task.

1 8. The method of claim 1, wherein the selecting step
2 includes the step of adaptively selecting the selected
3 program module using a reinforcement learning algorithm.

1 9. The method of claim 8, further comprising the
2 steps of:

- 3 (a) obtaining performance information relating
4 to the performance of the selected program module in
5 handling the computer task; and
6 (b) supplying the performance information to
7 the reinforcement learning algorithm.

1 10. The method of claim 8, wherein the reinforcement
2 learning algorithm is implemented in an adaptive heuristic
3 critic neural network.

1 11. The method of claim 1, wherein the selecting
2 step includes the steps of:

- 3 (a) matching each of the plurality of program
4 modules with a value of the objective criteria;
5 (b) determining a selected value of the
6 objective criteria; and
7 (c) selecting as the selected program module a
8 program module matching the selected value of the
9 objective criteria.

1 12. The method of claim 11, wherein the selecting
2 step further includes the step of retrieving information
3 for a selected computer task, wherein the determining step
4 determines the selected value of the objective criteria
5 using the retrieved information.

1 13. The method of claim 1, wherein the intelligent
2 agent is configured to conduct negotiations in an
3 electronic commerce application, and wherein the domain
4 knowledge for each of the plurality of program modules is
5 related to the autonomy delegated thereto.

1 14. The method of claim 13, wherein the plurality of
2 program modules includes a semi-autonomous program module,
3 a fully-autonomous program module, and a fully-dependent
4 program module.

1 15. The method of claim 13, wherein the objective
2 criteria includes a risk that a dispatched agent is
3 subjected to in negotiations.

1 16. An apparatus for handling a computer task,
2 comprising:
3 an intelligent agent including at least one of a
4 plurality of program modules having varied degrees of
5 domain knowledge, wherein the plurality of program
6 modules are configured to handle a common computer
7 task, and wherein, based upon an objective criteria,
8 at least one selected program module from the
9 plurality of program modules is selected to handle
10 the computer task.

1 17. The apparatus of claim 16, further comprising an
2 evaluation module configured to select the selected
3 program module based upon the objective criteria.

1 18. The apparatus of claim 17, further comprising a
2 reinforcement learning module, coupled to the evaluation
3 module and configured to adaptively select program modules
4 based upon the performance of the plurality of program
5 modules in handling the computer task.

1 19. The apparatus of claim 18, wherein the
2 reinforcement learning module comprises an adaptive
3 heuristic critic neural network.

1 20. The apparatus of claim 17, wherein the
2 evaluation module is configured to retrieve information
3 for a selected computer task, determine a selected value
4 for the objective criteria for the selected computer task,
5 and select as the selected program module one of the
6 plurality of program modules which is matched with the
7 selected value of the objective criteria.

1 21. The apparatus of claim 17, wherein the
2 evaluation module is implemented in an agent manager.

1 22. The apparatus of claim 17, wherein the
2 evaluation module is implemented in the intelligent agent.

1 23. The apparatus of claim 17, wherein the
2 intelligent agent includes only the selected program
3 module from the plurality of program modules, and wherein
4 the evaluation module is configured to construct the
5 intelligent agent using the selected program module.

6 24. The apparatus of claim 17, wherein the
7 intelligent agent includes each of the plurality of
8 program modules, and wherein the evaluation module is
9 configured to execute only the selected program module to
10 handle the computer task.

1 25. The apparatus of claim 17, wherein the plurality
2 of program modules are additive program modules, and
3 wherein the evaluation module is configured to select a
4 subset of the plurality of program modules to handle the
5 computer task.

1 26. The apparatus of claim 17, wherein the plurality
2 of program modules are alternative program modules, and
3 wherein the evaluation module is configured to select only
4 one of the plurality of program modules to handle the
5 computer task.

1 27. The apparatus of claim 16, wherein the
2 intelligent agent is configured to conduct negotiations in
3 an electronic commerce application, and wherein the domain
4 knowledge for each of the plurality of program modules is
5 related to the autonomy delegated thereto.

1 28. The apparatus of claim 27, wherein the plurality
2 of program modules includes a semi-autonomous program
3 module, a fully-autonomous program module, and a fully-
4 dependent program module.

1 29. The apparatus of claim 27, wherein the objective
2 criteria includes a risk that a dispatched agent is
3 subjected to in negotiations.

- 1 30. A program product comprising:
- 2 (a) a program configured to perform a computer
- 3 task using an intelligent agent, the program
- 4 comprising an intelligent agent including at least
- 5 one of a plurality of program modules having varied
- 6 degrees of domain knowledge, wherein the plurality of
- 7 program modules are configured to handle a common
- 8 computer task, and wherein, based upon an objective
- 9 criteria, at least one selected program module from
- 10 the plurality of program modules is selected to
- 11 handle the computer task; and
- 12 (b) a signal bearing media bearing the program.

1 31. The program product of claim 30, wherein the

2 signal bearing media is transmission type media.

1 32. The program product of claim 30, wherein the

2 signal bearing media is recordable media.

- 1 33. A method of handling a computer task on a remote
- 2 computer system using an intelligent agent, the method
- 3 comprising the steps of:
- 4 (a) determining a risk for the remote computer
- 5 system;
- 6 (b) based upon the risk for the remote computer
- 7 system, selecting at least one selected program
- 8 module from a plurality of program modules having
- 9 varied degrees of domain knowledge, wherein the
- 10 plurality of program modules are configured to handle
- 11 a common computer task in the remote computer system;
- 12 and
- 13 (c) configuring an intelligent agent to execute
- 14 the at least one selected program module to handle
- 15 the computer task.

1 34. The method of claim 33, further comprising the
2 step of matching each of the plurality of program modules
3 with a risk level.

1 35. The method of claim 34, wherein the matching
2 step includes the step of adaptively matching each program
3 module based upon the actual performance of the plurality
4 of program modules.